BLUE ROCK
ENVIRONMENTAL, INC.

FILE COPY

Mr. Mark Verhey
Humboldt County Health Department
Division of Environmental Health
100 H Street, Suite 100
Eureka, California 95501

September 28, 2005

Re: Additional Assessment & Third Quarter 2005 Groundwater Monitoring Report
Former Cash Oil Fortuna
409 South Fortuna Boulevard, Fortuna, CA
HCDEH LOP No. 12652
Blue Rock Project No. NC-004

Dear Mr. Verhey,

This report presents the results of the additional assessment activities and third quarter 2005 groundwater monitoring activities at 409 South Fortuna Boulevard, Fortuna, Humboldt County, California (site) (Figure 1), and was prepared for Clyde Harvey by Blue Rock Environmental, Inc. (Blue Rock). The assessment activities included installation of three well pairs screened from approximately 4 to 10 feet below ground surface (bgs) and 15 to 20 feet bgs, and sampling of deeper groundwater at approximately 35 to 40 feet bgs.

This work was originally proposed in Blue Rock's *Second Quarter 2005 Groundwater Monitoring Report and Workplan for Evaluation of Shallow Water Bearing Zone and Vertical Gradients*, dated July 6, 2005, which was approved by the Humboldt County Division of Environmental Health (HCDEH) in a letter dated July 8, 2005.

Background

Site Description

The former Cash Oil Service Station is located on the corner of South Fortuna Boulevard and Newburg Road in Fortuna, California. The site is located in an area of low topographic relief and is considered part of the Eel River flood plain (Figure 1). The site formerly contained one single-story building with four pump islands that were used to dispense unleaded gasoline from four fiberglass lined, single walled steel 10,000-gallon underground storage tanks (UST), three in Complex #1 and one in Complex #2 (Figure 2).

Site History

On May 8, 1997, as part of a UST system upgrade, Clearwater Group (Clearwater) observed Tank Liners Inc. drill three soil borings B-1, B-2, and B-3 for collection of soil and groundwater samples as required by the HCDEH (Figure 2). Laboratory analytical results from the soil and groundwater samples indicated that an unauthorized release of petroleum had occurred from the UST system.

In May 2000, Cash Oil Company sold the property and upgraded UST system to Golden Gate Petroleum of Martinez, California.

In August 2004, Beacom Construction (Beacom) of Fortuna, California, on behalf of Golden Gate Petroleum, removed the (4) 10,000-gallon USTs and associated fuel dispensers from the site. The site is being redeveloped as a commercial property.

Site Investigation History

Subsurface investigation activities have been ongoing at the site since 2000. A total of approximately 12 soil borings (B-1 through B-12) have been drilled and eight monitoring wells (MW-1 through MW-8) have been installed at the site (Figure 2). Groundwater monitoring has been ongoing since the wells were installed. Monitoring well construction data are summarized on Table 1, soil sample data are summarized on Table 2, and groundwater sample data are summarized on Table 3.

Summary of Contaminant Type

The predominant contaminant types that have been detected in the subsurface include total petroleum hydrocarbons as gasoline (TPHg), benzene, toluene, ethylbenzene, and xylenes (BTEX), and the fuel oxygenates MTBE, TBA, ETBE, and TAME.

Summary of Hydrogeology

The first couple feet below grade consists of baserock fill. The site is underlain by sediments characterized as elastic clayey silt (MH) from ~2 feet bgs to depth of ~17 feet bgs, which is underlain by gravel (GW) with a lesser amount of sand (SW) to a depth of ~20 feet bgs (the maximum depth explored). The laterally continuous clayey silt is often damp to moist, but water has not entered borings from this unit at consistent depths. Water has been encountered at different depths in this unit at different times of the year. It has often not been encountered in borings/wells until depths of at least 10 feet bgs and water is often encountered at a depth of ~18 feet in the gravel that rapidly rises several feet, except for borings B-4 through B-11. These borings were drilled in March 2000, and water was encountered at depths ranging between 2.5 to 7 feet bgs in soil described as elastic clayey silt.

During excavation activities in August 2004, Blue Rock observed a moist horizon of the elastic clayey silt at a depth of ~4 feet bgs, which was ~1 foot thick. However, no water entered the excavation from this horizon over the course of two days, and no water was observed dripping or seeping down the sidewall from that horizon. The bottom of the excavation was an irregular surface, with final depths ranging between 6 and 18 feet bgs. No groundwater was observed in the excavation, either collected in the bottom or seeping down sidewalls, except for depths of ~18 feet bgs where the top of the gravel was exposed. Excavation photographs were provided to the HCDEH with the *Remedial Report of Findings*, dated September 1, 2004.

Based on these observations, seasonal occurrence of perched water may occur in an elastic clayey silt, ~1 foot thick, at a depth of ~4 feet bgs. This likely results from the seasonal precipitation infiltrating downward, and therefore, this is why water was encountered at that relatively shallow depths depth in the spring (i.e. March 2000). Yet, this perched water zone appears to dry out and does not yield water in the summer (i.e. August 2004 excavation).

The behavior of the water in the gravel (i.e. rapidly rising after encountering it) suggests this unit may be confined. Blue Rock reviewed past potentiometric maps, and found that the interpreted potentiometric surface forms a smooth surface with flow toward the west-northwest (consistent with topography), if MW-7 data is excluded as anomalous.

Summary of Remedial Efforts

In August 2004, Blue Rock supervised Van Meter Construction of Redway, California excavate 2,034 tons of petroleum contaminated soil from the vicinity of the former UST fuel system. The lateral extent of the excavation is shown on Figure 2, and the depth of the excavation was irregular, ranging from approximately 6 to 18 feet bgs. The remedial soil excavation removed an estimated 2,109 pounds (346 gallons) of hydrocarbons from the site. Blue Rock mixed approximately 750 pounds of ORC into the excavation backfill. Monitoring well MW-3 was destroyed during remedial excavation activities. Remedial activities are presented in Blue Rock's *Remedial Report of Findings*, dated September 1, 2004.

Purpose and Scope of Additional Investigation

The purpose of this phase of work is to (1) evaluate the potential and nature of a perched water bearing zone (referred to here as the "A Zone") at approximately 5 to 10 feet bgs and its relationship to a lower zone (referred to here as the "B-Zone") from approximately 15 to 20 feet bgs, and (2) evaluate the vertical extent of dissolved-phase impacts from approximately 35 to 40 feet bgs (referred to here as the "C-Zone").

In order to accomplish the first goal, a set of three dual-completion well sets were installed so that the calculation of lateral groundwater flow in each zone and measurement of potential vertical gradients between the A- and B-Zones could be performed. The dual-completion wells were installed in individual boreholes separated laterally by 5 feet. The dual-completion well screens were separated vertically by at about 5 feet, so that potential vertical gradients between

the two zones could be evaluated. The dual-completion well sets installed as part of this investigation are summarized below:

- MW-9A and MW-9B: Located along the western edge of the site, in native material between the site border and the remedial excavation.

- MW-10A and MW-10B: Located between MW-7 and MW-5, in native material outside of the remedial excavation.

- MW-11A and MW-11B: Located near B-6, in native material between the site border and the remedial excavation.

In order to accomplish the second goal, grab groundwater samples were collected from discrete depth interval at 35 to 40 feet bgs (C-Zone) from temporary borings. These borings are summarized below:

- HP-9: Located along the western edge of the site, in native material between the site border and the remedial excavation (near MW-9A/B).

- HP-10: Located between MW-7 and MW-5, in native material outside of the remedial excavation (near MW-10A/B).

- HP-11: Located near B-6, in native material between the site border and the remedial excavation (near MW-11A/B).

Investigation and Monitoring Methods

Permitting and Utility Clearance

Prior to drilling, Blue Rock prepared site specific Health and Safety Plan and obtained well installation permits from HCDEH. Prior to conducting and drilling, the site was marked by Underground Service Alert to identify utilities leading to the site.

Drilling, Soil Sampling, and Installation/Development of Dual-Completion Well Sets

On August 17, 2005, the dual-completion wells were installed (MW-9A & 9B, MW-10A & 10B, and MW-11A & 11B). A Blue Rock scientist, working under the supervision of a Blue Rock California Professional Geologist, supervised all drilling and well installation activities. Drilling was performed by Mitchell Drilling Environmental (MDE), a C-57 licensed driller based in Eureka, California. MDE used a truck-mounted rill-rig equipped with 8-inch diameter hollow-stem augers to advance the borings. During drilling, soil samples were collected at five-foot intervals using a California Modified Split-Spoon sampler lined with clean, brass tubes. The Blue Rock scientist logged soil types in accordance with the Unified Soil Classification System. Additionally, soil samples were screened for the presence of volatile petroleum hydrocarbon vapors with a photo-ionizing organic vapor meter (OVM).

The borings for the A-Zone wells were drilled to a total depth of 10 feet bgs, and the borings for the B-Zone wells were drilled to a total depth of 20 feet bgs.

Between two to three soil samples were retained from each dual-completion well drilling location for laboratory analysis. These samples were selected based on filling gaps in sample depths from previous nearby borings. These samples were covered with Teflon lined plastic caps, labeled, documented on a chain-of custody form, and placed on ice in a cooler for transport to the project laboratory.

Blue Rock supervised construction of monitoring wells in the boreholes. Well screens targeted two zones: the A-Zone wells were screened from 4 to 10 feet bgs, and the B-Zone wells were screened from 15 to 20 feet bgs. The wells were constructed of clean, flush-threaded, two-inch diameter PVC well materials. Well screen consisted of 0.01-inch slot. A filter pack of Lonestar #2/12 sand extended from the bottom of each boring to one feet above the screened interval. The filter pack was sealed by a one-foot layer of hydrated bentonite. The remaining annular space was filled with cement and a tamper-resistant box will be concreted in place over the wellhead. Soil boring logs and well completion diagrams are attached.

On August 22, 2005, the wells were developed by surging and bailing. Development involved the removal of water from each well until such time it was relatively free of sediment, and pH, temperature, and conductivity parameters had stabilized. The water volume removed from each new well was approximately 10 saturated casing volumes. Wells MW-9A and MW-11A could not be developed because they were dry.

Third Quarter 2005 Groundwater Monitoring Activities

On August 22, 2005, all 13 projects wells (MW-1, MW-2, MW-4 through MW-8, and MW-9A&B through MW-11A&B) and MW-16 (Fortuna Beacon - Humboldt Petroleum) were gauged for depth to water, and 11 eleven wells were scheduled to be sampled. MW-9A and MW-11A could not be sampled because they were dry.

Prior to sampling, an electronic water level indicator was used to gauge depth to water in each well, accurate to within ±0.01-foot. All wells were checked for the presence of light non-aqueous phase liquid (LNAPL) petroleum prior to purging. No measurable thicknesses of LNAPL were observed on groundwater in any of the wells.

In preparation for sampling, the wells were purged of groundwater until sampling parameters (temperature, pH, and conductivity) stabilized. Dissolved oxygen measurements were collected from each well.

Following recovery of water levels to approximately 80% of their static levels, groundwater samples were collected from the wells using disposable polyethylene bailers and transferred to laboratory supplied containers. Sample containers were labeled, documented on a chain-of-custody form, and placed on ice in a cooler for transport to the project laboratory.

Purging instruments were cleaned between use by an Alconox® wash followed by double rinse in clean tap water to prevent cross-contamination. Purge and rinseate water was stored on-site in labeled 55-gallon drums pending future removal and disposal.

Groundwater monitoring and well purging information is presented on Gauge Data/Purge Calculations and Purge Data sheets (attached).

Vertical Delineation Drilling and Grab Groundwater Sampling

On August 29, 2005, vertical delineation activities for groundwater impacts was completed (HP-1, HP-2, and HP-3). A Blue Rock scientist, working under direct supervision of a California Professional Geologist at Blue Rock, supervised drilling and sampling activities. Drilling activities were performed by Fisch Environmental (Fisch), a C-57 licensed driller based in Valley Springs, California. Fisch used a direct-push drill-rig, equipped with 2-inch diameter drill-rod, to collect grab depth discrete groundwater samples.

These depth discrete groundwater sampled were collected form approximately 35 to 40 feet bgs (referred to here as the C-Zone) because the deepest screened wells at the site are only 20 feet bgs. Information from the nearby site at 390 South Fortuna Boulevard indicates that soil types between approximately 25 and 40 feet bgs are sands and gravels, with intercalated silt/clay and sand/gravel present from approximately 20 to 25 feet bgs.

These C-Zone groundwater samples were obtained by driving an expendable sampling tip to 40 feet bgs. The sampling tip was coupled to tubing back to the surface, and the tip was retracted several feet to expose the screened portion of the tool to the formation at a depth of approximately 35 to 40 feet bgs. Grab groundwater samples were then collected in appropriate containers, labeled, documented on a chain-of-custody form, and placed on ice in a cooler for transport to the project laboratory.

Due to the nature of depth discrete groundwater sampling methodology, soil samples could not be collected from these borings for logging purposes. Following sampling, these soil borings were backfilled with cement grout.

Surveying

On August 29, 2005, the new wells and sampling points were surveyed according to GeoTracker requirements.

Decontamination and Management of Investigation Derived Soil and Water

Prior to, and between, use all downhole drilling and sampling equipment was either steam-cleaned or washed in an Alconox® solution followed by double rinse in clean tap water. Soil cuttings and auger/sampler rinseate were stored in labeled 55-gallon drums on-site pending appropriate disposal. Blue Rock will utilize the analytical results for soil and/or water samples collected from the borings to coordinate soil and water recycling/disposal.

Soil and Groundwater Sample Analyses

The soil and groundwater samples were analyzed by Kiff Analytical LLC, a DHS-certified laboratory located in Davis, California, for the following:

- TPHg, BTEX, and MTBE by EPA Method 8260B (soil and groundwater)
- Five Fuel Oxygenates (MTBE, TBA, DIPE, ETBE, TAME) by EPA Method 8260B (groundwater only).

Investigation Results

Hydrogeological Observations

The soil types observed were consistent with previous investigation efforts. In general, the site is underlain by sediments characterized as elastic clayey silt (MH) from ~2 feet bgs to depth of ~17 feet bgs, which is underlain by gravels (GW) and sands (SW) to a depth of ~20 feet bgs (the maximum depth explored). Cross-sections are shown on Figures 3a and 3b, and boring logs for MW-9A/B, MW-10A/B, and MW-11A/B are attached.

During these drilling efforts, groundwater was first encountered in the sand/gravel, at a depth of approximately 17 feet bgs. Despite these conditions, wells were installed in both the A-Zone (4 to 10 feet bgs) and the B-Zone (15 to 20 feet bgs). After installation, water only entered one the A-Zone well: MW-10A. Water in the newly installed B-Zone wells subsequently stabilized at approximately 14 feet bgs.

Static groundwater in the wells was present in the wells at depths ranging from approximately 4.38 (MW-7) to 14.28 (MW-9B) feet bgs. Gauging data, combined with well elevation data, were used to calculate groundwater elevations, and to generate a groundwater elevation and gradient map.

Groundwater flow direction in the A-Zone could not be determined this period because only one of three wells in this zone contained water.

Groundwater flow direction in the B-Zone was calculated to be toward the west-northwest at a gradient of 0.016 ft/ft (Figure 4). Only wells MW-9B, MW-10B, and MW-11B were used to calculate this flow direction; however, it should be noted that almost all of the previously installed wells have groundwater elevations that appear to fall within the pattern of data from B-Zone wells, except MW-7. Hydraulic data from MW-7 appear to be more consistent with A-Zone wells.

The potential for vertical gradients was also evaluated using data from the well set of MW-10A and MW-10B. Groundwater elevations these two wells were 53.99 ft msl and 44.98 ft msl, respectively. This indicates that there is a downward gradient between the A- and B-Zones. This was the anticipated result, as water in the A-Zone is hypothesized to originate mostly form surface infiltration which accumulates in the A-Zone as it migrates downward.

Soil Sample Results and Summary of Soil Impacts

Neither TPHg nor BTEX were detected in any of the eight soil samples analyzed, except for low levels of benzene (0.041 mg/kg) and xylenes (0.015 mg/kg) in sample MW-9 at 10 feet bgs. MTBE was detected in six of the eight soil samples analyzed, and concentrations ranged from 0.0081 mg/kg (MW-11 at 15 feet bgs) to 0.15 mg/kg (MW-9 at 15 feet bgs).

These results are generally consistent with previous investigation results. It appears the majority of residual sorbed-phase gasoline is present along the western edge of the remedial excavation in the area of MW-1 (Figure 5). Cumulative soil sample analytical data are presented on Table 2.

Groundwater Sample Results and Summary of Groundwater Impacts

Only one well in the A-Zone contained water for sampling (MW-10A), and it did not contain detectable levels of TPHg, BTEX, or MTBE. Coupled with historical grab groundwater sampling data from the same depth interval, the lateral extent of dissolved-phase contaminants in this zone appears effectively delineated to the north, south, and east. Assuming groundwater enters the other A-Zone wells in the coming winter months, more will be learned about the lateral distribution of dissolved-phase contaminants in this zone after future quarterly sampling events. The distribution of A-Zone groundwater sample results are shown on Figure 6a.

Like the groundwater elevations, data from previously installed wells (some screened from 5-20 feet bgs) also fell into the same general pattern with contaminant concentrations for B-Zone wells. Using these data, the lateral extent of dissolved-phase contaminants in the B-Zone appears to be relatively well delineated. The core of the plume in this zone appears to be located on the western (downgradient) side of the former dispenser islands, and the plume appears to be elongated east-west, parallel to the direction of groundwater flow in this zone (Figure 6b). The maximum TPHg, benzene, and MTBE concentrations were 2,600 µg/L (MW-1), 6.3 µg/L (MW-1), and 860 µg/L (MW-9B).

Groundwater samples from C-Zone borings (HP-1, HP-2, and HP-3) did not contain detectable levels of TPHg, BTEX, or MTBE. Therefore, the vertical extent of dissolved-phase contaminants does not appear to extend beyond a depth of 35 feet bgs. Dissolved-phase analytical data for this zone are shown on Figure 6c.

Cumulative groundwater sample analytical results are summarized in Table 3, and intrinsic bioremediation data are summarized in Table 4. Copies of the laboratory report and chain-of-custody form are attached.

Summary

There appears to be a perched water bearing zone located at within the general depth interval of 4 to 10 feet bgs, referred to here as the A-Zone. This zone consists of fine-grained soil types, i.e. silt/clay, and does not appear to be very permeable. Water stabilized in one of the A-Zone wells (MW-10A) at a depth of approximately 4.5 feet bgs; however, water did not enter the other A-Zone wells. This may be the result of that fact these wells were installed near the end of the dry season, and it is likely that water will enter these wells after the winter rains begin.

The B-Zone wells tap sands/gravels beginning at approximately 17 feet bgs (screened from 15 to 20 feet bgs) show groundwater flow generally toward west. Depth to water in these wells generally stabilized at a depth of 14.5 feet bgs. Potentiometric data from almost all of the other wells previously installed at the site (screened from 5 to 20 feet bgs) fell within the pattern of data from the B-Zone, except MW-7, which appeared to be more consistent with the A-Zone data.

The extent of sorbed- and dissolved-phase contaminants appears relatively well delineated. The residual sorbed-phase gasoline contaminants are located along the western edge of the remedial excavation in the area of MW-1, and the majority of this sorbed-phase mass is located at a depth interval of approximately 5 feet bgs.

The extent and magnitude of A-Zone dissolved-phase contamination appears to be relatively minimal; however, more will be learned about this zone assuming water enters all A-Zone wells for future sampling events. It appears the greatest dissolved-phase impact occurs in the B-Zone, in which the dissolved-phase plume core is located around, and immediately downgradient of, the former dispenser islands. The plume in this zone appears to be elongated east-west, parallel to groundwater flow. The maximum TPHg, benzene, and MTBE concentrations recently detected in this zone are approximately 2,600 µg/l, 1.6 µg/L, and 860 µg/L, respectively. The downgradient extent of the plume in the B-Zone appears to extend about 40 feet west of MW-16 (HPI well). Water samples collected from the C-Zone (approximately 35 to 40 feet bgs) did not contain detectable concentrations of gasoline contaminants.

Based on the results of this investigation, it appears most of the monitoring wells at the site which are screened from 5 to 20 feet bgs may intersect two water bearing zones. It should be noted that despite intersecting two zones, data from most of these wells appears to be consistent with B-Zone wells, except for data from MW-7, which appears to be more consistent with A-zone wells. Nevertheless, wells screened from 5 to 20 feet do appear to cross two water bearing zones, and as such, should be properly destroyed and reinstalled as conditions warrant.

Recommendations

Blue Rock recommends the following well destruction and replacement program:

- **MW-1** (Screen 5 to 20 feet bgs): Destroy and do not reinstall. New wells MW-9A and 9B now monitor this area and are more appropriately screened than MW-1.

- **MW-2** (Screen 5 to 15 feet bgs): Destroy and do not reinstall. This well has been free of detectable gasoline contaminants since March 2003. Groundwater levels appear to be more correlative with B-Zone wells despite being screened to only 15 feet. The fact that this well has been consistently clean suggests the delineation of the plume in both the A- and B-Zones, because if any contamination were present in either of these zones it would be indicated by detection of gasoline contaminants from a well screened across both zones.

- **MW-4** (Screen 5 to 20 feet bgs): Destroy and replace as dual-completion well. This well has contained contamination; however, based on its construction it is unclear if this contamination is sourced from the A- or B-Zones. This well should be destroyed and replaced by a dual-completion set (i.e. MW-9A and MW-9B) in the same general location.

- **MW-5** (Screen 5 to 20 feet bgs): Destroy and do not reinstall. This well has been free of gasoline contaminants exceeding clean-up goals since installation in March 2002. The fact that this well has been consistently clean suggests the delineation of the plume in both the A- and B-Zones, because if any contamination were present in either of these zones it would be indicated by detection of gasoline contaminants from a well screened across both zones.

- **MW-6** (Screen 5 to 20 feet bgs): Destroy and do not reinstall. This well has been free of gasoline contaminants exceeding clean-up goals since installation in March 2002. The fact that this well has been consistently clean suggests the delineation of the plume in both the A- and B-Zones, because if any contamination were present in either of these zones it would be indicated by detection of gasoline contaminants from a well screened across both zones.

- **MW-7** (Screen 5 to 20 feet bgs): Destroy and replace as dual-completion well. This well has contained contamination; however, based on its construction it is unclear if this contamination is sourced from the A- or B-Zones. This well should be destroyed and replaced by a dual-completion set (i.e. MW-9A and MW-9B) in the same general location.

- **MW-8** (Screen 5 to 20 feet bgs): Destroy and do not reinstall. This well has contained low levels of MTBE in the past. New wells MW-10A and 10B now monitor this area and are more appropriately screened than MW-8.

- **MW-16** (HPI well screen 10 to 20 feet bgs): This well appears to be screened in the B-Zone and represents a downgradient monitoring point for the edge of the plume. Blue Rock recommends the continued use of this well to monitor the downgradient extent of the subject plume.

Project Status

- The site is currently being monitored on a quarterly basis per the HCDEH directives. The next quarterly sampling event is scheduled for November 2005. Groundwater samples will be analyzed for TPHg, BTEX, and MTBE.

Certification

This report was prepared under the supervision of a California Professional Geologist at Blue Rock. All statements, conclusions, and recommendations are based upon published results from past consultants, field observations by Blue Rock, and analyses performed by a state-certified laboratory as they relate to the time, location, and depth of points sampled by Blue Rock. Interpretation of data, including spatial distribution and temporal trends, are based on commonly used geologic and scientific principles. It is possible that interpretations, conclusions, and recommendations presented in this report may change, as additional data become available and/or regulations change.

Information and interpretation presented herein are for the sole use of the client and regulating agency. The information and interpretation contained in this document should not be relied upon by a third party.

The service performed by Blue Rock has been conducted in a manner consistent with the level of care and skill ordinarily exercised by members of our profession currently practicing under similar conditions in the area of the site. No other warranty, expressed or implied, is made.

If you have any questions regarding this project, please contact us at (707) 441-1934.

Sincerely,
Blue Rock Environmental, Inc.

Prepared by:

Scott Ferriman
Project Scientist

Reviewed by:

Brian Gwinn, PG
Principal Geologist

Attachments:

- Table 1: Well Construction Details
- Table 2: Soil Analytical Data
- Table 3: Groundwater Elevations and Analytical Data
- Table 4: Intrinsic Bioremediation Data
- Figure 1: Site Location Map
- Figure 2: Site Plan
- Figure 3a: A-A' Cross-Section
- Figure 3b: B-B' Cross-Section
- Figure 4: Groundwater Elevation Map – B-Zone– August 22, 2005
- Figure 5: TPHg in Soil Map
- Figure 6a: Groundwater Contaminant Map – A-Zone – August 22, 2005
- Figure 6b: Groundwater Contaminant Map – B-Zone – August 22, 2005
- Figure 6c: Groundwater Contaminant Map – C-Zone – August 22, 2005
- Soil Boring Logs & Well Construction Diagrams
  (MW-9A/B/HP-9, MW-10A/B/HP-10, and MW-11A/B/HP-11)
- Blue Rock Gauge/Purge Calculations and Well Purging Data field sheets
- Laboratory Analytical Report and Chain-of-Custody Form

Distribution:

- Mr. Clyde Harvey, 1785 Fort Douglas Circle, Salt Lake City, UT 84103
- Mr. Dennis O'Keefe, Golden Gate Petroleum, 501 Shell Avenue, Martinez, CA 94553

Table 1
WELL CONSTRUCTION DETAILS
Former Cash Oil Fortuna
409 South Fortuna Boulevard
Fortuna, California
Blue Rock Project No. NC-004

Monitoring Well Identification	Date Intstalled	Intstalled by	Casing Diameter (inches)	Total Depth (feet)	Blank Interval (feet)	Screened Interval (feet)	Slot Size (inches)	Filter Pack (feet)	Bentonite Seal (feet)	Cement Grout (feet)
MW-1	1/10/01	Clearwater	2	20	0-5	5-20	0.02	4.5-20	3-4.5	0-3
MW-2	1/11/01	Clearwater	2	15	0-5	5-15	0.02	4.5-15	3-4.5	0-3
MW-3*	1/10/01	Clearwater	2	20	0-5	5-20	0.02	4.5-20	3-4.5	0-3
MW-4	1/11/01	Clearwater	2	20	0-5	5-20	0.02	4.5-20	3-4.5	0-3
MW-5	3/2/02	Clearwater	2	20.5	0-5	5-20	0.02	4-20	3-4	0-3
MW-6	3/2/02	Clearwater	2	20.5	0-5	5-20	0.02	4-20	3-4	0-3
MW-7	3/2/02	Clearwater	2	20.5	0-5	5-20	0.02	4-20	3-4	0-3
MW-8	6/11/02	Clearwater	2	20	0-5	5-20	0.02	4-20	3-4	0-3
MW-9A	8/17/05	Blue Rock	2	9	0-4	4-10	0.01	3-10	2-3	0-2
MW-9B	8/17/05	Blue Rock	2	20	0-15	15-20	0.01	14-20	13-14	0-13
MW-10A	8/17/05	Blue Rock	2	9	0-4	4-10	0.01	3-10	2-3	0-2
MW-10B	8/17/05	Blue Rock	2	20	0-15	15-20	0.01	14-20	13-14	0-13
MW-11A	8/17/05	Blue Rock	2	9	0-4	4-10	0.01	3-10	2-3	0-2
MW-11B	8/17/05	Blue Rock	2	20	0-15	15-20	0.01	14-20	13-14	0-13

*MW-3 was removed during remedial excavation activities in 8/04.

Table 2
SOIL ANALYTICAL DATA
Former Cash Oil Fortuna
409 South Fortuna Boulevard
Fortuna, California
Blue Rock Project No. NC-004

Sample ID	Sample Depth (feet bgs)	Sample Date	TPHg (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)	MTBE (mg/kg)	TBA (mg/kg)	DIPE (mg/kg)	ETBE (mg/kg)	TAME (mg/kg)	Methanol (mg/kg)	Ethanol (mg/kg)
Soil Samples Collected at UST Removal														
T1 West	13	8/5/04	<1	<0.005	<0.005	<0.005	**0.0068**	<0.02	<0.4	<0.02	<0.02	<0.02	--	--
T1 East	13	8/5/04	<1	<0.005	<0.005	<0.005	<0.01	<0.05	--	--	--	--	--	--
T2 West	13	8/5/04	<1	<0.005	<0.005	<0.005	**0.006**	<0.05	--	--	--	--	--	--
T2 East	13	8/5/04	<1	<0.005	<0.005	<0.005	<0.01	<0.05	--	--	--	--	--	--
T3 West	13	8/5/04	<1	<0.005	<0.02	<0.005	**0.018**	<0.05	--	--	--	--	--	--
T3 East	12	8/5/04	<1	<0.005	<0.005	<0.005	<0.01	<0.02	<0.4	<0.02	<0.02	<0.02	--	--
T4 West	12	8/5/04	<1	<0.005	<0.005	<0.005	<0.01	<0.05	--	--	--	--	--	--
T4 East	13	8/5/04	**16**	<0.005	<0.005	<0.005	**0.0075**	<0.05	--	--	--	--	--	--
Soil Samples Collected to Verify Removal of Impacted Soil During Remedial Excavation														
EX-1	15	8/9/04	**720**	<0.1	<0.1	**2.8**	**7.0**	<0.1	**4.59**	--	--	--	--	--
EX-2	3	8/10/04	**1.4**	**0.016**	<0.005	**0.0059**	**0.017**	**0.21**	--	--	--	--	--	--
EX-3	14	8/11/04	**250**	**0.01**	<0.005	**0.072**	**0.027**	**0.059**	--	--	--	--	--	--
EX-4	5	8/12/04	**120**	**0.36**	**0.087**	**0.52**	**1.7**	**0.62**	**16**	--	--	--	--	--
EX-5	10	8/13/04	**420**	<0.05	<0.05	**2.7**	**6.3**	<0.05	--	--	--	--	--	--
EX-6	5	8/14/04	**760**	<0.25	<0.25	<0.25	<0.25	<0.25	--	--	--	--	--	--
EX-7	5	8/16/04	**1,200**	<0.25	<0.25	<0.25	<0.25	**0.84**	--	--	--	--	--	--
Investigation Samples Removed of During Remedial Excavation														
B-3	11.5	5/8/97	**170**	<0.13	<0.5	**0.74**	**4.1**	<1.3	--	--	--	--	--	--
B-4	4	3/14/00	<1	<0.005	<0.005	<0.005	<0.01	<0.05	--	--	--	--	--	--
B-4	8	3/14/00	<1	**0.0072**	<0.005	<0.005	<0.01	<0.05	--	--	--	--	--	--
B-8	4	3/14/00	**610**	<0.08	<0.08	<0.08	**0.083**	**0.081**	<4	<0.2	<0.2	<0.2	--	--
B-8	8	3/14/00	<1	**0.0065**	<0.005	<0.005	<0.01	<0.005	<0.5	<0.02	<0.02	<0.02	--	--
B-9	4	3/14/00	**5.2**	<0.005	<0.005	<0.005	<0.01	**0.097**	<0.5	<0.02	<0.02	<0.02	--	--
B-9	8	3/14/00	<1	<0.005	<0.005	<0.005	<0.01	**0.038**	<0.5	<0.02	<0.02	<0.02	--	--
B-10	4	3/14/00	**1.6**	<0.005	<0.005	<0.01	<0.02	<0.05	--	--	--	--	--	--
B-10	8	3/14/00	<1	<0.005	<0.005	<0.005	<0.01	<0.05	--	--	--	--	--	--
B-11	4	3/14/00	**20**	<0.005	<0.005	<0.005	<0.01	**0.045**	<0.5	<0.02	<0.02	<0.02	--	--
B-11	8	3/14/00	<1	**0.0059**	<0.005	<0.005	<0.01	<0.005	<0.5	<0.02	<0.02	<0.02	--	--
MW-3	5	1/10/01	<1.0	<0.005	<0.005	<0.005	<0.005	**0.62**	**0.072**	<0.005	<0.005	**0.031**	<0.2	<0.02
MW-3	10	1/10/01	<1.0	<0.005	<0.005	<0.005	<0.005	**0.067**	<0.01	<0.005	<0.005	<0.005	<0.2	<0.02

Table 2
SOIL ANALYTICAL DATA
Former Cash Oil Fortuna
409 South Fortuna Boulevard
Fortuna, California
Blue Rock Project No. NC-004

Sample ID	Sample Depth (feet bgs)	Sample Date	TPHg (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)	MTBE (mg/kg)	TBA (mg/kg)	DIPE (mg/kg)	ETBE (mg/kg)	TAME (mg/kg)	Methanol (mg/kg)	Ethanol (mg/kg)
Confirmation Samples Collected from Sidewalls and Bottom of Remedial Excavation														
EB-1@18'	18	8/9/04	<1	<0.005	<0.005	<0.005	<0.005	**0.18**	--	--	--	--	--	--
EB-2@15'	15	8/12/04	<1	<0.005	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--
EB-3@6'	6	8/12/04	<1	<0.005	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--
EB-4@6'	6	8/12/04	<1	**0.015**	<0.005	<0.005	<0.005	**0.056**	--	--	--	--	--	--
EB-5@6'	6	8/13/04	<1	<0.005	<0.005	<0.005	<0.005	**0.03**	--	--	--	--	--	--
EB-6@7'	7	8/13/04	<1	<0.005	<0.005	<0.005	<0.005	**0.24**	--	--	--	--	--	--
EB-7@6'	6	8/14/04	<1	<0.005	<0.005	<0.005	<0.005	**0.089**	--	--	--	--	--	--
EB-8@6'	6	8/14/04	<1	<0.005	<0.005	<0.005	<0.005	**0.12**	--	--	--	--	--	--
EB-9@15'	15	8/16/04	<1	<0.005	<0.005	<0.005	<0.005	**0.30**	--	--	--	--	--	--
SW-1@10'	10	8/11/04	<1	<0.005	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--
SW-2@10'	10	8/11/04	<1	<0.005	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--
SW-3@10'	10	8/11/04	<1	<0.005	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--
SW-4@10'	10	8/11/04	<1	<0.005	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--
SW-5@5'	5	8/12/04	<1	<0.005	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--
SW-6@5'	5	8/13/04	<1	<0.005	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--
SW-7@5'	5	8/13/04	<1	<0.005	<0.005	<0.005	<0.005	**0.013**	--	--	--	--	--	--
SW-8@5'	5	8/13/04	<1	<0.005	<0.005	<0.005	<0.005	**0.14**	--	--	--	--	--	--
SW-9@5'	5	8/13/04	**8.3**	<0.005	<0.005	**0.0061**	<0.005	**0.079**	--	--	--	--	--	--
SW-10@7'	7	8/16/04	**8.8**	<0.005	<0.005	**0.0059**	<0.01	**0.012**	--	--	--	--	--	--
SW-11@7'	7	8/16/04	<1	<0.005	<0.005	**0.0054**	<0.005	**0.0076**	--	--	--	--	--	--
SW-12@7'	7	8/16/04	<1	<0.005	<0.005	<0.005	<0.005	**0.0080**	--	--	--	--	--	--

Table 2
SOIL ANALYTICAL DATA
Former Cash Oil Fortuna
409 South Fortuna Boulevard
Fortuna, California
Blue Rock Project No. NC-004

Sample ID	Sample Depth (feet bgs)	Sample Date	TPHg (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)	MTBE (mg/kg)	TBA (mg/kg)	DIPE (mg/kg)	ETBE (mg/kg)	TAME (mg/kg)	Methanol (mg/kg)	Ethanol (mg/kg)
Investigation Soil Samples in Non-Excavated Area														
B-1	13	5/8/97	<1	<0.005	<0.005	<0.005	<0.01	<0.05	--	--	--	--	--	--
B-2	12	5/8/97	<1	<0.005	<0.005	<0.005	<0.01	<0.05	--	--	--	--	--	--
B-5	4	3/14/00	<1	<0.005	<0.005	<0.005	<0.01	<0.05	--	--	--	--	--	--
B-5	8	3/14/00	<1	<0.005	<0.005	<0.005	<0.01	<0.05	--	--	--	--	--	--
B-6	4	3/14/00	<1	<0.005	<0.005	<0.005	<0.01	<0.05	--	--	--	--	--	--
B-6	8	3/14/00	<1	<0.005	<0.005	<0.005	<0.01	<0.05	--	--	--	--	--	--
B-7	4	3/14/00	<1	<0.005	<0.005	<0.005	<0.01	<0.05	--	--	--	--	--	--
B-7	8	3/14/00	<1	<0.005	<0.005	<0.005	<0.01	<0.05	--	--	--	--	--	--
B-12	2.5	1/12/01	<1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.2	<0.02
MW-1	5	1/10/01	**630**	<0.05	<0.05	**1.6**	<0.05	<0.05	<0.5	**0.13**	<0.05	<0.05	<1	<2
MW-1	10	1/10/01	<1.0	**0.03**	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.005	<0.005	<0.5	<0.05
MW-2	5	1/11/01	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.005	<0.005	<0.5	<0.05
MW-2	10	1/11/01	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.2	<0.02
MW-4	5	1/11/01	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.005	<0.005	<0.2	<0.05
MW-4	10	1/11/01	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.2	<0.02
MW-5	10	3/2/02	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	--	--
MW-5	15	3/2/02	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	--	--
MW-6	10	3/2/02	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	--	--
MW-6	15	3/2/02	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	--	--
MW-7	10	3/2/02	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	--	--
MW-7	15	3/2/02	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	--	--
MW-8	10	6/11/02	<1.0	<0.005	<0.005	<0.005	<0.005	**0.0085**	<0.005	<0.005	<0.005	<0.005	--	--
MW-8	20	6/11/02	<1.0	<0.005	<0.005	<0.005	<0.005	**0.035**	**0.0083**	<0.005	<0.005	<0.005	--	--
MW-9	10	8/17/05	<1.0	**0.041**	<0.005	<0.005	**0.015**	**0.040**	--	--	--	--	--	--
MW-9	15	8/17/05	<1.0	<0.005	<0.005	<0.005	<0.005	**0.15**	--	--	--	--	--	--
MW-9	20	8/17/05	<1.0	<0.005	<0.005	<0.005	<0.005	**0.090**	--	--	--	--	--	--
MW-10	5	8/17/05	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--
MW-10	15	8/17/05	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--
MW-10	20	8/17/05	<1.0	<0.005	<0.005	<0.005	<0.005	**0.024**	--	--	--	--	--	--
MW-11	15	8/17/05	<1.0	<0.005	<0.005	<0.005	<0.005	**0.0081**	--	--	--	--	--	--
MW-11	20	8/17/05	<1.0	<0.005	<0.005	<0.005	<0.005	**0.052**	--	--	--	--	--	--

Notes

bgs: below ground surface
"--" Not analyzed, available or applicable
mg/kg = milligrams per kilogram
<###: Not detected above the method detection limit as shown
TPHg: Total petroleum hydrocarbons as gasoline by EPA Method 5030/8015M or 5030/8260B
BTEX by EPA Method 8020 or 8260B
MTBE: Methyl tertiary butyl ether by EPA 8020 or 8260B
TBA: Tertiary butanol by EPA 8260B
DIPE: Di isopropyl ether by EPA 8260B
ETBE: Ethyl tertiary butyl ether by EPA 8260B
TAME: Tertiary amyl methyl ether by EPA 8260B
Methanol: by EPA Method 8260B
Ethanol: by EPA method 8260B

Table 3
GROUNDWATER ELEVATIONS AND ANALYTICAL DATA
Former Cash Oil Fortuna
409 South Fortuna Boulevard
Fortuna, California
Blue Rock Project No. NC-004

Sample ID	Sample Date	TOC (feet)	DTW (feet)	SPH (feet)	GWE (feet)	TPHg (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	MTBE (µg/L)	TBA (µg/L)	DIPE (µg/L)	ETBE (µg/L)	TAME (µg/L)	Methanol (µg/L)	Ethanol (µg/L)
Grab Groundwater Samples																	
GW-3 (B-3)	5/8/99	--	--	0.00	--	**23,000**	**63**	**110**	**600**	**1,630**	<130	--	--	--	--	--	--
B-4	3/14/00	--	~7	0.00	--	**210**	**4.1**	<0.5	<0.5	**0.79**	<0.5	<10	<1	<1	<1	--	--
B-5	3/14/00	--	~5	0.00	--	<50	<0.5	<0.5	<0.5	<1	**0.79**	<10	<1	<1	<1	--	--
B-6	3/14/00	--	~4	0.00	--	**110**	<0.5	<0.5	<0.5	<1	<0.5	<10	<1	<1	<1	--	--
B-7	3/14/00	--	~4	0.00	--	<50	<0.5	<0.5	<0.5	<1	<0.5	<10	<1	<1	<1	--	--
B-8	3/14/00	--	~4	0.00	--	**19,000**	**18**	**2.4**	**20**	**3.8**	**1,100**	<100	<5	**12**	**91**	--	--
B-9	3/14/00	--	~4	0.00	--	**20,000**	**36**	**22**	**11**	<8	**3,900**	<200	<10	<10	**310**	--	--
B-10	3/14/00	--	~2.5	0.00	--	<63	<0.5	<0.5	<0.5	<1	<0.5	<13	<1	<1	<1	--	--
B-11	3/14/00	--	~4.5	0.00	--	**14,000**	**26**	**2.6**	**41**	**5**	**580**	<100	<5	<5	**12**	--	--
HP-9	8/29/05	--	~40	0.00	--	<50	<0.5	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--
HP-10	8/29/05	--	~40	0.00	--	<50	<0.5	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--
HP-11	8/29/05	--	~40	0.00	--	<50	<0.5	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--
Monitoring Well Groundwater Samples																	
MW-1	1/19/01	99.75	11.37	0.00	88.38	**4,900**	**5**	**1.1**	**14**	**2.3**	**200**	**29**	<1	**5.4**	**6.1**	<100	<10
Screen	5/4/01	99.75	11.29	0.00	88.46	**4,500**	**12**	<2	**7.8**	<2	**620**	**31**	<2	<2	**24**	<500	<20
5' - 20'	8/16/01	99.75	15.40	0.00	84.35	**7,700**	**13**	**1.7**	**23**	**2.6**	**280**	**16**	<0.5	**2.4**	**13**	<50	<5
	11/1/01	99.75	15.74	0.00	84.01	**3,100**	**10**	**0.85**	**9.8**	**1.4**	**220**	**22**	<0.5	**2.5**	**9.4**	<1,500	<5
	3/6/02	58.74	12.32	0.00	46.42	**7,700**	**28**	<2.5	**14**	<2.5	**980**	**39**	<2.5	**3.9**	**49**	--	--
	6/20/02	58.74	13.59	0.00	45.15	**3,400**	**33**	<2.5	**13**	<2.5	**1,100**	**40**	<2.5	**3**	**48**	--	--
	9/3/02	58.74	15.61	0.00	43.13	**1,500**	**6.2**	<2.5	<2.5	<2.5	**1,200**	**38**	<2.5	**2.9**	**40**	--	--
	12/11/02	58.74	16.31	0.00	42.43	**4,200**	**14**	<2	**9.8**	<2	**870**	**25**	<2	**2.4**	**27**	--	--
	3/7/03	58.74	12.37	0.00	46.37	**8,100**	**19**	<2.5	**15**	**3.9**	**1,300**	**39**	<2.5	<2.5	**52**	--	--
	6/3/03	58.74	11.96	0.00	46.78	**6,800**	**19**	<2.5	**12**	<2.5	**1,200**	**37**	<2.5	**3**	**54**	--	--
	9/2/03	58.74	15.21	0.00	43.53	**5,900**	**12**	<1.5	**13**	**1.7**	**800**	**27**	<1.5	**2.2**	**31**	--	--
	12/3/03	58.74	15.07	0.00	43.67	**6,100**	**6.8**	**1.5**	**15**	**2.5**	**730**	**29**	<1	**2.9**	**37**	--	--
	3/9/04	58.74	11.42	0.00	47.32	**5,500**	**11**	<2	**12**	<2	**940**	**37**	<2	**2.1**	**45**	--	--
	6/8/04	58.74	13.38	0.00	45.36	**7,000**	**11**	<5	**14**	<10	**780**	<50	<5	<5	**43**	--	--
	9/3/04	58.74	15.79	0.00	42.95	**810**	**6.8**	<1	**3.7**	<1	**400**	--	--	--	--	--	--
	12/8/04	58.74	12.79	0.00	45.95	**3,700**	**4.7**	**1.5**	**20**	**1.9**	**270**	--	--	--	--	--	--
	3/25/05	58.74	10.79	0.00	47.95	**7,400**	**4.8**	**1.4**	**21**	**1.4**	**240**	--	--	--	--	--	--
	6/13/05	58.74	12.14	0.00	46.60	**3,700**	**7.8**	**1.9**	**15**	**1.7**	**190**	--	--	--	--	--	--
	8/22/05	58.74	14.05	0.00	44.69	**2,600**	**6.3**	**0.87**	**6.8**	**1.0**	**130**	--	--	--	--	--	--

Table 3
GROUNDWATER ELEVATIONS AND ANALYTICAL DATA
Former Cash Oil Fortuna
409 South Fortuna Boulevard
Fortuna, California
Blue Rock Project No. NC-004

Sample ID	Sample Date	TOC (feet)	DTW (feet)	SPH (feet)	GWE (feet)	TPHg (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	MTBE (µg/L)	TBA (µg/L)	DIPE (µg/L)	ETBE (µg/L)	TAME (µg/L)	Methanol (µg/L)	Ethanol (µg/L)
Monitoring Well Groundwater Samples																	
MW-2	1/19/01	99.24	12.41	0.00	86.83	<50	<0.5	<0.5	<0.5	<0.5	**2.4**	<5	<0.5	<0.5	<0.5	<50	<5
Screen	5/4/01	99.24	11.07	0.00	88.17	<50	<0.5	<0.5	<0.5	<0.5	**11**	<5	<0.5	<0.5	<0.5	<50	<5
5' - 15'	8/16/01	99.24	14.24	0.00	85.00	<50	<0.5	<0.5	<0.5	<0.5	**14**	<5	<0.5	<0.5	<0.5	<50	<5
	11/1/01	99.24	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	3/6/02	58.18	10.74	0.00	47.44	<50	<0.5	<0.5	<0.5	<0.5	**1.2**	<5	<0.5	<0.5	<0.5	--	--
	6/20/02	58.18	12.70	0.00	45.48	<50	<0.5	<0.5	<0.5	<0.5	**2.3**	<5	<0.5	<0.5	<0.5	--	--
	9/3/02	58.18	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/11/02	58.18	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	3/7/03	58.18	10.04	0.00	48.14	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	--	--
	6/3/03	58.18	10.06	0.00	48.12	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	--	--
	9/2/03	58.18	14.01	0.00	44.17	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	--	--
	12/3/03	58.18	13.13	0.00	45.05	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	--	--
	3/9/04	58.18	9.07	0.00	49.11	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	--	--
	6/8/04	58.18	12.14	0.00	46.04	<50	<0.5	<0.5	<0.5	<1	<0.5	<5	<0.5	<0.5	<0.5	--	--
	9/3/04	58.18	14.55	0.00	43.63	<50	<0.5	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--
	12/8/04	58.18	8.51	0.00	49.67	<50	<0.5	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--
	3/25/05	58.18	8.63	0.00	49.55	<50	<0.5	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--
	6/13/05	58.18	10.26	0.00	47.92	<50	<0.5	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--
	8/22/05	58.18	13.00	0.00	45.18	--	--	--	--	--	--	--	--	--	--	--	--
MW-3	1/19/01	99.77	9.88	0.00	89.89	<2,000	<20	<20	<20	<20	**15,000**	**560**	<20	<20	**490**	<2,000	<200
Screen	5/4/01	99.77	4.96	0.00	94.81	**4,800**	**630**	<20	**72**	**130**	**7,700**	**570**	<20	<20	**200**	<2,000	<200
5' - 20'	8/16/01	99.77	15.64	0.00	84.13	**1,300**	**14**	**0.98**	**1.6**	**1.1**	**6,800**	**320**	<0.5	**6**	**240**	<150	<5
	11/1/01	99.77	15.98	0.00	83.79	<2,000	<20	<20	<20	<20	**6,600**	**460**	<20	<20	**270**	<35,000	<200
	3/6/02	58.72	13.06	0.00	45.66	<2,000	<20	**21**	<20	<20	**6,600**	**240**	<20	<20	**160**	--	--
	6/20/02	58.72	11.70	0.00	47.02	**1,900**	**57**	<5	<5	<5	**2,900**	**90**	<5	<5	**140**	--	--
	9/3/02	58.72	15.53	0.00	43.19	<1,000	<10	<10	<10	<10	**3,300**	**130**	<10	<10	**110**	--	--
	12/11/02	58.72	16.48	0.00	42.24	<1,000	<10	<10	<10	<10	**3,600**	**110**	<10	<10	**110**	--	--
	3/7/03	58.72	4.18	0.00	54.54	**3,300**	**150**	**5.4**	**7.1**	**18**	**2,300**	**77**	<5	<5	**110**	--	--
	6/3/03	58.72	4.40	0.00	54.32	**3,000**	**100**	**4.4**	**4.2**	**12**	**1,900**	**56**	<2.5	<2.5	**96**	--	--
	9/2/03	58.72	14.69	0.00	44.03	<500	<5	<5	<5	<5	**2,300**	**68**	<5	<5	**80**	--	--
	12/3/03	58.72	14.79	0.00	43.93	**1,600**	**89**	<5	<5	**8.1**	**2,300**	**78**	<5	<5	**120**	--	--
	3/9/04	58.72	7.90	0.00	50.82	**1,500**	**23**	<3	<3	**4.9**	**1,400**	**62**	<3	<3	**68**	--	--
	6/8/04	58.72	11.28	0.00	47.44	<5,000	<50	<50	<50	<100	**1,800**	<500	<50	<50	**89**	--	--
	8/13/04	Removed during remedial soil excavation activities															

Table 3
GROUNDWATER ELEVATIONS AND ANALYTICAL DATA
Former Cash Oil Fortuna
409 South Fortuna Boulevard
Fortuna, California
Blue Rock Project No. NC-004

Sample ID	Sample Date	TOC (feet)	DTW (feet)	SPH (feet)	GWE (feet)	TPHg (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	MTBE (µg/L)	TBA (µg/L)	DIPE (µg/L)	ETBE (µg/L)	TAME (µg/L)	Methanol (µg/L)	Ethanol (µg/L)
Monitoring Well Groundwater Samples																	
MW-4	1/19/01	99.12	12.17	0.00	86.95	**150**	<1	<1	<1	<1	**680**	**210**	<1	<1	**11**	<100	<10
Screen	5/4/01	99.12	10.71	0.00	88.41	<200	<2	<2	<2	<2	**440**	**120**	<2	<2	**16**	<200	<20
5' - 20'	8/16/01	99.12	14.83	0.00	84.29	<50	<0.5	<0.5	<0.5	<0.5	**250**	<5	<0.5	<0.5	**10**	<50	<5
	11/1/01	99.12	14.76	0.00	84.36	**61**	<0.5	<0.5	<0.5	<0.5	**210**	**18**	<0.5	<0.5	**8.5**	<50	<5
	3/6/02	58.07	10.28	0.00	47.79	**220**	<0.5	<0.5	<0.5	<0.5	**130**	**40**	<0.5	<0.5	**5.4**	--	--
	6/20/02	58.07	12.41	0.00	45.66	<50	<0.5	<0.5	<0.5	<0.5	**440**	**32**	<0.5	<0.5	**20**	--	--
	9/3/02	58.07	14.34	0.00	43.73	<250	<2.5	<2.5	<2.5	<2.5	**1,300**	**35**	<2.5	<2.5	**34**	--	--
	12/11/02	58.07	15.23	0.00	42.84	<500	<5	<5	<5	<5	**2,300**	<50	<5	<5	**54**	--	--
	3/7/03	58.07	10.48	0.00	47.59	**330**	<1	<1	<1	<1	**570**	**33**	<1	<1	**28**	--	--
	6/3/03	58.07	10.12	0.00	47.95	**130**	<0.5	<0.5	<0.5	<0.5	**380**	**19**	<0.5	<0.5	**23**	--	--
	9/2/03	58.07	13.82	0.00	44.25	**85**	<0.5	<0.5	<0.5	<0.5	**390**	**12**	<0.5	<0.5	**17**	--	--
	12/3/03	58.07	13.91	0.00	44.16	**220**	<0.5	<0.5	<0.5	<0.5	**510**	**31**	<0.5	<0.5	**22**	--	--
	3/9/04	58.07	9.51	0.00	48.56	<500	<5	<5	<5	<5	**2,000**	**220**	<5	<5	**5.6**	--	--
	6/8/04	58.07	12.03	0.00	46.04	**210**	<0.5	<0.5	<0.5	<1	**420**	**25**	<0.5	<0.5	**1.5**	--	--
	9/3/04	58.07	14.41	0.00	43.66	<100	<1	<1	<1	<1	**430**	--	--	--	--	--	--
	12/8/04	58.07	10.72	0.00	47.35	<50	<0.5	<0.5	<0.5	<0.5	**140**	--	--	--	--	--	--
	3/25/05	58.07	8.97	0.00	49.10	<50	<0.5	<0.5	<0.5	<0.5	**40**	--	--	--	--	--	--
	6/13/05	58.07	10.27	0.00	47.80	<50	<0.5	<0.5	<0.5	<0.5	**22**	--	--	--	--	--	--
	8/22/05	58.07	12.72	0.00	45.35	<50	<0.5	<0.5	<0.5	<0.5	**29**	--	--	--	--	--	--
MW-5	3/6/02	58.37	4.39	0.00	53.98	<50	<0.5	<0.5	<0.5	<0.5	**0.53**	<5	<0.5	<0.5	<0.5	--	--
Screen	6/20/02	58.49	12.50	0.00	45.99	<50	<0.5	<0.5	<0.5	**0.56**	<0.5	<5	<0.5	<0.5	<0.5	--	--
5' - 20'	9/3/02	58.49	14.49	0.00	44.00	<50	<0.5	<0.5	<0.5	<0.5	**1.3**	<5	<0.5	<0.5	<0.5	--	--
	12/11/02	58.49	15.39	0.00	43.10	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	--	--
	3/7/03	58.49	8.76	0.00	49.73	<50	<0.5	<0.5	<0.5	<0.5	**0.95**	<5	<0.5	<0.5	<0.5	--	--
	6/3/03	58.49	8.12	0.00	50.37	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	--	--
	9/2/03	58.49	14.02	0.00	44.47	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	--	--
	12/3/03	58.49	14.04	0.00	44.45	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	--	--
	3/9/04	58.49	6.35	0.00	52.14	<50	<0.5	<0.5	<0.5	<0.5	**1.1**	<5	<0.5	<0.5	<0.5	--	--
	6/8/04	58.49	11.95	0.00	46.54	<50	<0.5	<0.5	<0.5	<1	<0.5	<5	<0.5	<0.5	<0.5	--	--
	9/3/04	58.49	14.50	0.00	43.99	<50	<0.5	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--
	12/8/04	58.49	5.71	0.00	52.78	<50	<0.5	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--
	3/25/05	58.49	3.71	0.00	54.78	<50	<0.5	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--
	6/13/05	58.49	10.38	0.00	48.11	<50	<0.5	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--
	8/22/05	58.49	13.11	0.00	45.38	--	--	--	--	--	--	--	--	--	--	--	--

Table 3
GROUNDWATER ELEVATIONS AND ANALYTICAL DATA
Former Cash Oil Fortuna
409 South Fortuna Boulevard
Fortuna, California
Blue Rock Project No. NC-004

Sample ID	Sample Date	TOC (feet)	DTW (feet)	SPH (feet)	GWE (feet)	TPHg (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	MTBE (µg/L)	TBA (µg/L)	DIPE (µg/L)	ETBE (µg/L)	TAME (µg/L)	Methanol (µg/L)	Ethanol (µg/L)
Monitoring Well Groundwater Samples																	
MW-6	3/6/02	58.02	10.28	0.00	47.74	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	--	--
Screen	6/20/02	58.02	12.62	0.00	45.40	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	--	--
5' - 20'	9/3/03	58.02	14.33	0.00	43.69	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	--	--
	12/11/02	58.02	15.28	0.00	42.74	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	--	--
	3/7/03	58.02	10.67	0.00	47.35	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	--	--
	6/3/03	58.02	10.37	0.00	47.65	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	--	--
	9/2/03	58.02	13.87	0.00	44.15	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	--	--
	12/3/03	58.02	14.38	0.00	43.64	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	--	--
	3/9/04	58.02	9.62	0.00	48.40	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	--	--
	6/8/04	58.02	12.20	0.00	45.82	<50	<0.5	<0.5	<0.5	<1	<0.5	<5	<0.5	<0.5	<0.5	--	--
	9/3/04	58.02	14.48	0.00	43.54	<50	<0.5	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--
	12/8/04	58.02	12.95	0.00	45.07	<50	<0.5	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--
	3/25/05	58.02	10.45	0.00	47.57	<50	<0.5	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--
	6/13/05	58.02	10.70	0.00	47.32	<50	<0.5	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--
	8/22/05	58.02	12.84	0.00	45.18	--	--	--	--	--	--	--	--	--	--	--	--
MW-7	3/6/02	58.42	3.68	0.00	54.74	**110**	<0.5	<0.5	<0.5	<0.5	**78**	<5	<0.5	<0.5	**1.4**	--	--
Screen	6/20/02	58.42	4.27	0.00	54.15	**200**	<0.5	<0.5	<0.5	<0.5	**26**	<5	<0.5	<0.5	**0.7**	--	--
5' - 20'	9/3/02	58.42	5.77	0.00	52.65	**250**	<0.5	<0.5	<0.5	**2.5**	**30**	**15**	<0.5	<0.5	**0.51**	--	--
	12/11/02	58.42	6.21	0.00	52.21	**360**	<0.5	<0.5	<0.5	**4.5**	**37**	**9.2**	<0.5	<0.5	**0.74**	--	--
	3/7/03	58.42	3.80	0.00	54.62	**780**	<0.5	<0.5	**1.1**	**3.8**	**21**	<5	<0.5	<0.5	<0.5	--	--
	6/3/03	58.42	3.47	0.00	54.95	**650**	<0.5	<0.5	**0.85**	**2.6**	**17**	**5.3**	<0.5	<0.5	<0.5	--	--
	9/2/03	58.42	4.70	0.00	53.72	**470**	<0.5	<0.5	**0.59**	**1.6**	**13**	**7.5**	<0.5	<0.5	<0.5	--	--
	12/3/03	58.42	4.78	0.00	53.64	**490**	<0.5	<0.5	**0.64**	**1.5**	**17**	<5	<0.5	<0.5	<0.5	--	--
	3/9/04	58.42	3.45	0.00	54.97	**530**	<0.5	<0.5	**0.9**	**1.7**	**16**	**8.9**	<0.5	<0.5	<0.5	--	--
	6/8/04	58.42	3.75	0.00	54.67	**540**	<0.5	<0.5	**0.7**	**0.8**	**11**	<5	<0.5	<0.5	<0.5	--	--
	9/3/04	58.42	5.33	0.00	53.09	**290**	<0.5	<0.5	<0.5	**0.9**	**8.1**	--	--	--	--	--	--
	12/8/04	58.42	2.75	0.00	55.67	**670**	**0.57**	<0.5	**1.2**	**0.85**	**13**	--	--	--	--	--	--
	3/25/05	58.42	3.24	0.00	55.18	**1,100**	**0.56**	**0.58**	**2.8**	**0.92**	**8.4**	--	--	--	--	--	--
	6/13/05	58.42	3.87	0.00	54.55	**770**	<0.5	<0.5	**1.1**	**0.80**	**6.0**	--	--	--	--	--	--
	8/22/05	58.42	4.38	0.00	54.04	**530**	<0.5	<0.5	<0.5	<0.5	**2.7**	--	--	--	--	--	--

Table 3
GROUNDWATER ELEVATIONS AND ANALYTICAL DATA
Former Cash Oil Fortuna
409 South Fortuna Boulevard
Fortuna, California
Blue Rock Project No. NC-004

Sample ID	Sample Date	TOC (feet)	DTW (feet)	SPH (feet)	GWE (feet)	TPHg (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	MTBE (µg/L)	TBA (µg/L)	DIPE (µg/L)	ETBE (µg/L)	TAME (µg/L)	Methanol (µg/L)	Ethanol (µg/L)
Monitoring Well Groundwater Samples																	
MW-8	6/20/02	58.81	4.75	0.00	54.06	<50	<0.5	<0.5	<0.5	<0.5	**14**	<5	<0.5	<0.5	**0.52**	--	--
Screen	9/3/02	58.81	14.76	0.00	44.05	<50	<0.5	<0.5	<0.5	**0.63**	**11**	<5	<0.5	<0.5	<0.5	--	--
5' - 20'	12/11/02	58.81	16.55	0.00	42.26	**92**	<0.5	<0.5	<0.5	**2.1**	**21**	<5	<0.5	<0.5	**1.1**	--	--
	3/7/03	58.81	11.89	0.00	46.92	**67**	<0.5	<0.5	<0.5	<0.5	**17**	<5	<0.5	<0.5	**0.99**	--	--
	6/3/03	58.81	11.67	0.00	47.14	<50	<0.5	<0.5	<0.5	<0.5	**25**	<5	<0.5	<0.5	**1.5**	--	--
	9/2/03	58.81	15.53	0.00	43.28	**51**	<0.5	<0.5	<0.5	<0.5	**56**	<5	<0.5	<0.5	**3.6**	--	--
	12/3/03	58.81	15.31	0.00	43.50	**57**	<0.5	<0.5	<0.5	<0.5	**10**	<5	<0.5	<0.5	<0.5	--	--
	3/9/04	58.81	9.82	0.00	48.99	<50	<0.5	<0.5	<0.5	<0.5	**4.3**	<5	<0.5	<0.5	<0.5	--	--
	6/8/04	58.81	13.28	0.00	45.53	<50	<0.5	<0.5	<0.5	<0.5	**37**	<5	<0.5	<0.5	**0.9**	--	--
	9/3/04	58.81	15.68	0.00	43.13	<50	<0.5	<0.5	<0.5	<0.5	**21**	--	--	--	--	--	--
	12/8/04	58.81	13.47	0.00	45.34	<50	<0.5	<0.5	<0.5	<0.5	**41**	--	--	--	--	--	--
	3/25/05	58.81	11.26	0.00	47.55	<50	<0.5	<0.5	<0.5	<0.5	**16**	--	--	--	--	--	--
	6/13/05	58.81	11.85	0.00	46.96	<50	<0.5	<0.5	<0.5	<0.5	**5.6**	--	--	--	--	--	--
	8/22/05	58.81	14.11	0.00	44.70	<50	<0.5	<0.5	<0.5	<0.5	**10**	--	--	--	--	--	--
MW-9A	8/22/05	58.57	--	--	--	well dry, no sample		--	--	--	--	--	--	--	--	--	--
Screen																	
4' - 10'																	
MW-9B	8/22/05	58.54	14.28	0.00	44.26	**220**	**1.6**	<1	<1	**1.0**	**860**	--	--	--	--	--	--
Screen																	
15' - 20'																	
MW-10A	8/22/05	58.52	4.53	0.00	53.99	<50	<0.5	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--
Screen																	
4' - 10'																	
MW-10B	8/22/05	58.56	13.58	0.00	44.98	<50	<0.5	<0.5	<0.5	<0.5	**5.3**	--	--	--	--	--	--
Screen																	
15' - 20'																	
MW-11A	8/22/05	58.18	--	--	--	well dry, no sample		--	--	--	--	--	--	--	--	--	--
Screen																	
4' - 10'																	
MW-11B	8/22/05	58.39	13.14	0.00	45.25	<50	<0.5	<0.5	<0.5	<0.5	**160**	--	--	--	--	--	--
Screen																	
15' - 20'																	

Table 3
GROUNDWATER ELEVATIONS AND ANALYTICAL DATA
Former Cash Oil Fortuna
409 South Fortuna Boulevard
Fortuna, California
Blue Rock Project No. NC-004

Sample ID	Sample Date	TOC (feet)	DTW (feet)	SPH (feet)	GWE (feet)	TPHg (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	MTBE (µg/L)	TBA (µg/L)	DIPE (µg/L)	ETBE (µg/L)	TAME (µg/L)	Methanol (µg/L)	Ethanol (µg/L)
Monitoring Well Groundwater Samples																	
MW-16	6/20/02	57.54	12.79	0.00	44.75	--	--	--	--	--	--	--	--	--	--	--	--
(Humboldt	9/3/02	57.54	14.49	0.00	43.05	--	--	--	--	--	--	--	--	--	--	--	--
Pet. Well)	12/11/02	57.54	15.41	0.00	42.13	--	--	--	--	--	--	--	--	--	--	--	--
Screen	3/7/03	57.54	10.90	0.00	46.64	--	--	--	--	--	--	--	--	--	--	--	--
10' - 20'	6/3/03	57.54	10.76	0.00	46.78	--	--	--	--	--	--	--	--	--	--	--	--
	9/2/03	57.54	14.24	0.00	43.30	--	--	--	--	--	--	--	--	--	--	--	--
	12/3/03	57.54	14.71	0.00	42.83	--	--	--	--	--	--	--	--	--	--	--	--
	3/9/04	57.54	10.32	0.00	47.22	--	--	--	--	--	--	--	--	--	--	--	--
	6/8/04	57.54	12.33	0.00	45.21	--	--	--	--	--	--	--	--	--	--	--	--
	9/3/04	57.54	14.76	0.00	42.78	--	--	--	--	--	--	--	--	--	--	--	--
	12/8/04	57.54	13.27	0.00	44.27	--	--	--	--	--	--	--	--	--	--	--	--
	3/25/05	57.54	10.91	0.00	46.63	--	--	--	--	--	--	--	--	--	--	--	--
	6/13/05	57.54	11.03	0.00	46.51	--	--	--	--	--	--	--	--	--	--	--	--
	8/22/05	57.54	13.04	0.00	44.50	<50	<0.5	<0.5	<0.5	<0.5	**57**	--	--	--	--	--	--
					MCL	---	1.0	150	300	1,750	13						
					Taste and odor threshold	5	---	42	29	17	5						
					NCRWQCB Cleanup Goals	50	0.5	42	29	17	5						

Notes :

TOC: Top of well casing referenced to arbitrary site benchmark until 3/02, MSL thereafter
DTW: Depth to water as referenced to top of casing
SPH: Separate phase hydrocarbon on top of groundwater
GWE: Groundwater elevation as referenced to benchmark
µg/L = micrograms per liter
TPHg: Total petroleum hydrocarbons as gasoline by Method 5030/8015M or 5030/8260B
MTBE: Methyl tertiary butyl ether by Method 8020 or 8260B
MW-16 (LOP #12093) was used for the purpose of obtaining additional groundwater gradient and direction data.

TBA: Tertiary butyl alcohol by Method 8260B
DIPE: Di isopropyl ether by Method 8260B
ETBE: Ethyl tertiary butyl ether by Method 8260B
TAME: Tertiary amyl methyl ether by method 8260B
Methanol: by EPA Method 8260B
Ethanol: by EPA Method 8260B
MCL : Maximum contaminant level
NCRWQCB : North Coast Region Water Quality Control Board

Table 4
INTRINSIC BIOREMEDIATION DATA
Former Cash Oil Fortuna
409 South Fortuna Boulevard
Fortuna, California
Blue Rock Project # NC-004

Well ID	Date	TPHg (µg/L)	MTBE (µg/L)	DO* (mg/L)	Eh* (mV)	pH*	Total Alkalinity (mg/L)	Nitrate (mg/L)	Ammonia (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Ortho Phosphate (mg/L)	Ferrous Iron (mg/L)	Dissolved Manganese (mg/L)	TOC (mg/L)	BOD (mg/L)	COD (mg/L)	Heterotrophic Plate Count (CFU/mL)	Aerobic Hydrocarbon Degraders (CFU/mL)
MW-1	6/20/02	3,400	1,100	0.41	--	6.4	310	0.56	7.6	1.6	--	<0.5	7.4	--	52	5.4	97	7,000	1,000
	12/11/02	4,200	870	2.91	80	5.8	370	0.87	7.9	0.87	<1	<0.5	8.1	6,800	39	12	120	20,000	50
	9/3/04	810	400	1.87	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/8/04	3,700	270	1.80	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	3/25/05	7,400	240	0.65	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	6/13/05	3,700	190	3.16	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	8/22/05	2,600	130	2.56	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-2	6/20/02	<50	2.3	0.47	0.47	6.5	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/11/02	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	9/3/04	<50	<0.5	2.08	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/8/04	<50	<0.5	2.23	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	3/25/05	<50	<0.5	5.78	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	6/13/05	<50	<0.5	4.25	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	8/22/05	--	--	3.01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-3	6/20/02	1,900	2,900	0.42	--	6.5	340	0.54	10	1.2	--	<0.5	8.2	--	44	4.2	110	20,000	3,000
	12/11/02	<1,000	3,600	3.12	50	4.4	350	0.94	10	1.4	<1	<0.5	6.9	17,000	32	12	110	20,000	300
MW-4	6/20/02	<50	440	0.62	--	6.4	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/11/02	<500	2,300	2.87	165	6.0	--	--	--	--	--	--	--	--	--	--	--	--	--
	9/3/04	<100	430	1.96	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/8/04	<50	140	1.95	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	3/25/05	<50	40	0.40	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	6/13/05	<50	22	0.60	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	8/22/05	<50	29	0.66	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	6/20/02	<50	<0.5	0.57	--	6.4	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/11/02	<50	<0.5	2.71	197	6.1	--	--	--	--	--	--	--	--	--	--	--	--	--
	9/3/04	<50	<0.5	2.36	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/8/04	<50	<0.5	2.08	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	3/25/05	<50	<0.5	4.17	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	6/13/05	<50	<0.5	4.50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	8/22/05	--	--	1.63	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Table 4
INTRINSIC BIOREMEDIATION DATA
Former Cash Oil Fortuna
409 South Fortuna Boulevard
Fortuna, California
Blue Rock Project # NC-004

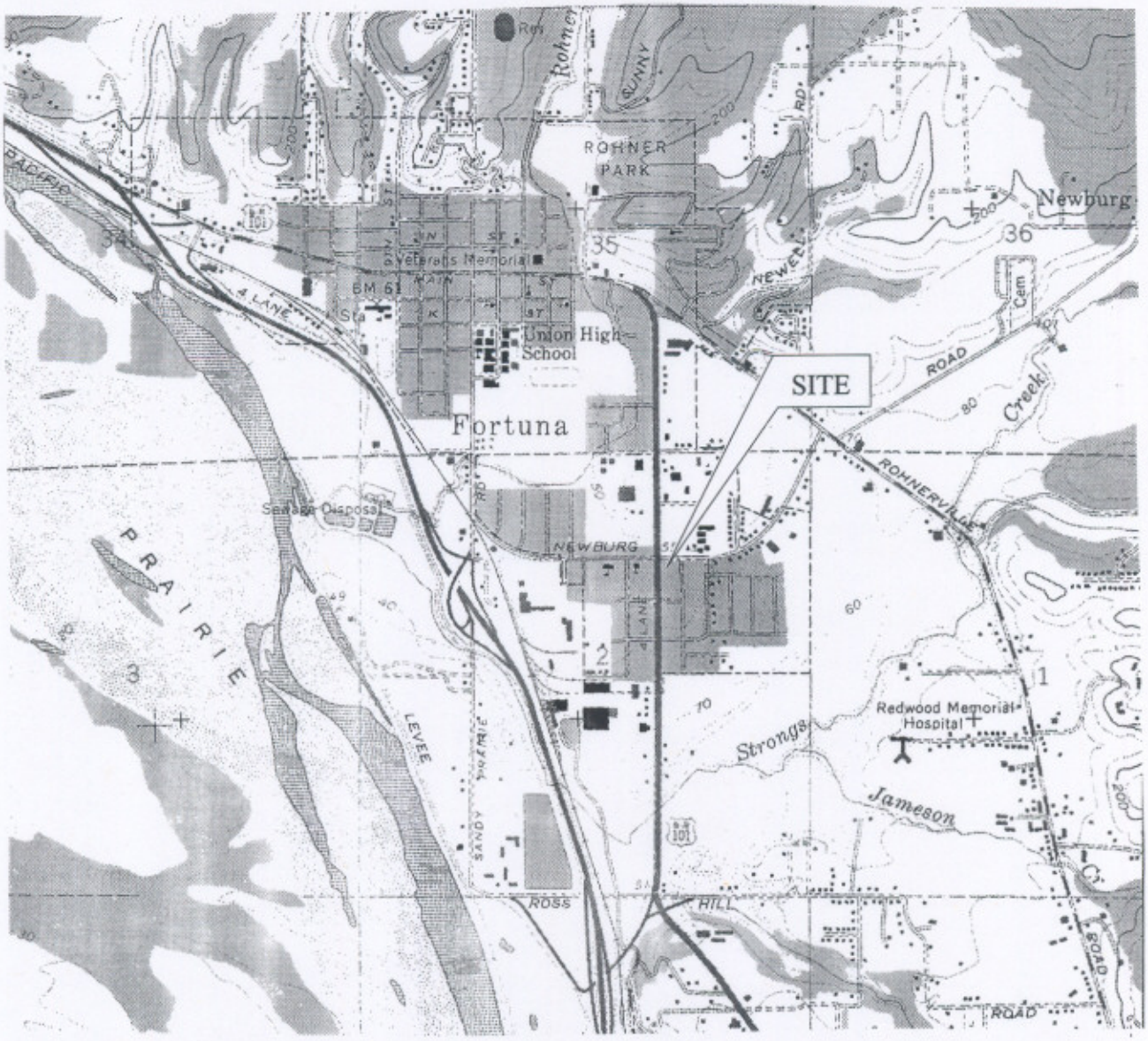
Well ID	Date	TPHg (µg/L)	MTBE (µg/L)	DO* (mg/L)	Eh* (mV)	pH*	Total Alkalinity (mg/L)	Nitrate (mg/L)	Ammonia (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Ortho Phosphate (mg/L)	Ferrous Iron (mg/L)	Dissolved Manganese (mg/L)	TOC (mg/L)	BOD (mg/L)	COD (mg/L)	Heterotrophic Plate Count (CFU/mL)	Aerobic Hydrocarbon Degraders (CFU/mL)
MW-6	6/20/02	<50	<0.5	0.56	--	6.4	87	13	<0.1	6.9	--	<0.5	<0.1	--	4.2	<3	13	200,000	40,000
	12/11/02	<50	<0.5	3.25	146	5.9	85	12	0.16	4.4	<1	<0.5	<0.1	18	3.2	<3	<10	80,000	200
	9/3/04	<50	<0.5	2.11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/8/04	<50	<0.5	2.04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	3/25/05	<50	<0.5	4.27	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	6/13/05	<50	<0.5	4.61	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	8/22/05	--	--	5.91	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-7	6/20/02	200	26	0.61	--	6.6	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/11/02	360	37	2.78	21	5.9	--	--	--	--	--	--	--	--	--	--	--	--	--
	9/3/04	290	8.1	2.12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/8/04	670	13	1.57	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	3/25/05	1,100	8.4	0.47	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	6/13/05	770	6.0	0.51	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	8/22/05	530	2.7	0.51	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-8	6/20/02	<50	14	0.58	--	6.5	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/11/02	92	21	2.37	79	5.9	--	--	--	--	--	--	--	--	--	--	--	--	--
	9/3/04	<50	21	1.99	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/8/04	<50	41	2.20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	3/25/05	<50	16	2.13	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	6/13/05	<50	5.6	0.72	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	8/22/05	<50	10	0.67	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Table 4
INTRINSIC BIOREMEDIATION DATA
Former Cash Oil Fortuna
409 South Fortuna Boulevard
Fortuna, California
Blue Rock Project # NC-004

Well ID	Date	TPHg (µg/L)	MTBE (µg/L)	DO* (mg/L)	Eh* (mV)	pH*	Total Alkalinity (mg/L)	Nitrate (mg/L)	Ammonia (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Ortho Phosphate (mg/L)	Ferrous Iron (mg/L)	Dissolved Manganese (mg/L)	TOC (mg/L)	BOD (mg/L)	COD (mg/L)	Heterotrophic Plate Count (CFU/mL)	Aerobic Hydrocarbon Degraders (CFU/mL)
MW-9A	8/22/05	dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-9B	8/22/05	220	860	3.37	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-10A	8/22/05	<50	<0.5	6.11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-10B	8/22/05	<50	5.3	7.04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-11A	8/22/05	dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-11B	8/22/05	<50	160	2.81	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-16 (HPI)	8/22/05	<50	57	1.01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Notes:

TPHg	Total petroleum hydrocarbons as gasoline by EPA Method 5030/8260B
MTBE	Methyl tertiary butyl ether by EPA Method 8260B
µg/L	micrograms per liter, equivalent to parts per billion - ppb
mg/L	milligrams per Liter, equivalent to parts per million - ppm
*	Parameters measured in field and recorded on field sheets
mV	Millivolts
CFU/mL	Colony forming units per milliliter
DO	Dissolved oxygen measured with downhole meter
Eh	Reduction-oxidation potential measured with downhole meter
pH	pH measured with field meter
Alkalinity	by EPA Method 310.1
Nitrate	by EPA Method 300.0
Ammonia	by EPA Method 350.2
Manganese	by EPA Method 200.7
Sulfate	by EPA Method 375.4
Sulfide	by EPA Method 376.2
Phosphate	by EPA Method 365.2
TOC	Total organic carbon by EPA Method 9060
Ferrous Iron	by Standard Method 3500
BOD	Biological oxygen demand by Standard Method 5210B
COD	Chemical oxygen demand by EPA Method 410.4
Heterotrophic Plate Count	Bacteria enumeration assay by Standard Method 9215B modified
Hydrocarbon Degraders	Bacteria enumeration assay for diesel and gasoline degraders
"--":	Not analyzed, available, or applicable
<###	Not detected above the number indicated



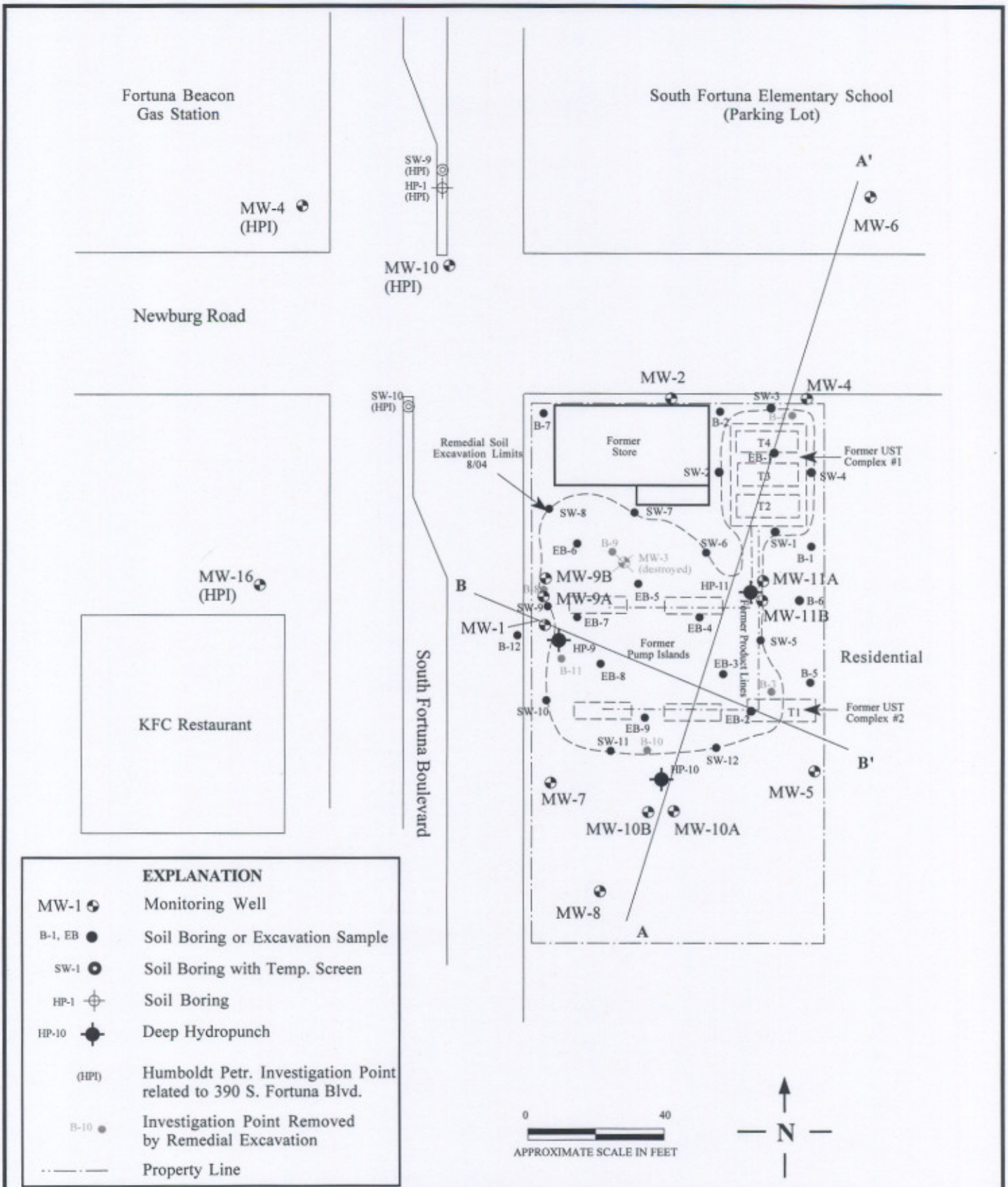
MAP SOURCE: USGS Fortuna Quadrangle

Site Location Map

Former Cash Oil Fortuna
409 South Fortuna Boulevard
Fortuna, California

BLUE ROCK ENVIRONMENTAL, INC.

Project No.	Date	Figure
NC-004	4/04	1

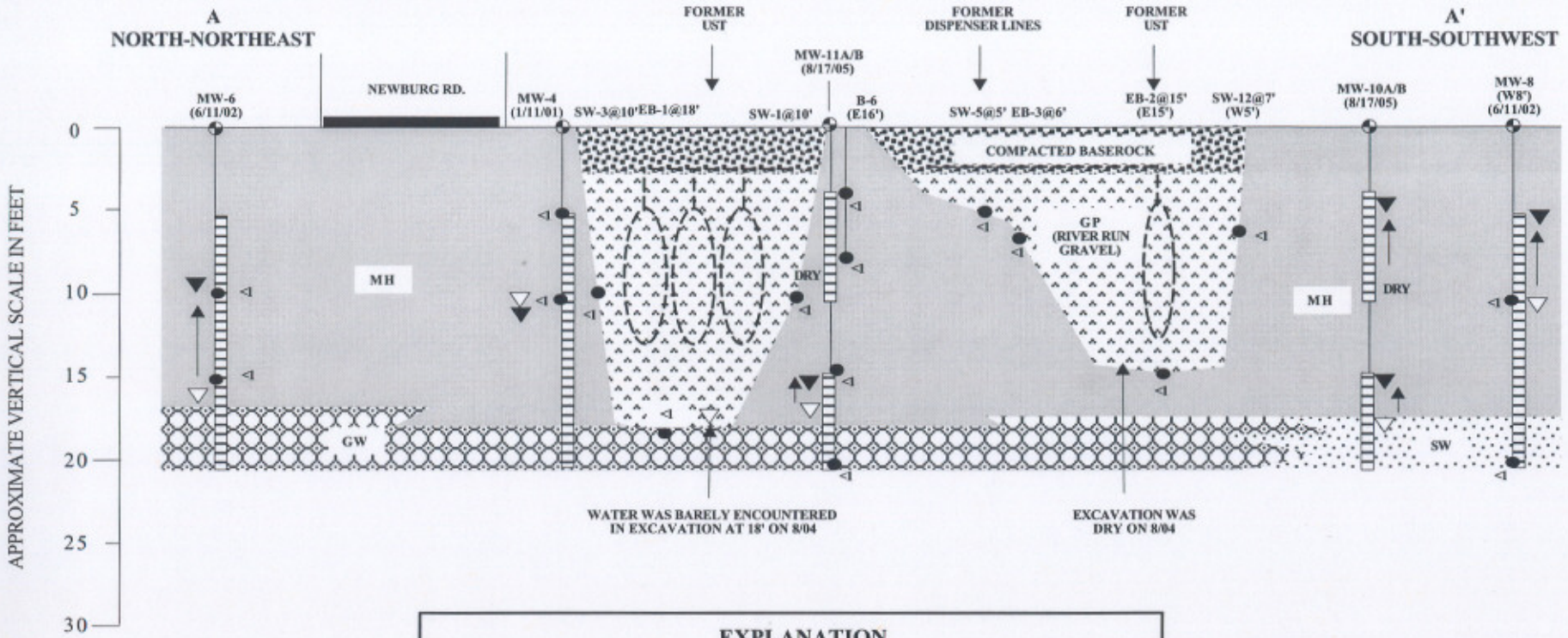


Site Plan

Former Cash Oil Fortuna
409 South Fortuna Boulevard
Fortuna, California

BLUE ROCK ENVIRONMENTAL, INC.

Project No.	Report Date	Figure
NC-004	9/05	2



EXPLANATION

- SILT (MH)
- GRAVEL (GW)
- RIVER RUN GRAVEL FILL (GP)
- BASEROCK
- STABLIZED WATER DURING DRILLING
- FIRST ENCOUNTERED WATER DURING DRILLING
- SOIL SAMPLE

- MW-3 — BORING/WELL I.D.
- (N10') — DIRECTION AND DISTANCE FROM SECTION LINE
- LOGGED & SCREENED INETERVAL
- 1.2 — TPHg CONCENTRATION (mg/kg) SOIL SAMPLES
- TPHg = 10 — TPHg ISO-CONCENTRATION IN SOIL (mg/kg)

0' 30'
10'

APPROXIMATE SCALE
HORIZONTAL SCALE: 1"=30'
VERTICAL SCALE: 1"=10'

A-A' CROSS-SECTION

Cash Oil Fortuna
409 South Fortuna Blvd.
Fortuna, CA

BLUE ROCK ENVIRONMENTAL, INC.

Project No.	Figure Date	Figure
NC-004	9/05	3a